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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

25X1A

[redacted]

COUNTRY International

SUBJECT Oxygen Blowing Process for Steel Making

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[redacted]

4. "'Converter Lining - The methods [redacted] oxygen blown converters basic are in principle similar as applied to [redacted] bottom blown or side blown converters.

5. "'The experiences of Linz and Donawitz /Austria/ and Huckingen /German Mannesmann, Duisburg- Huckingen/ have shown that the performance with magnesit, magnesitic dolomit or calcined dolomit was about equal, since conditions during the process of blowing in the oxygen blown converter is much less severe than in the bottom blown converter. We are giving the following principal analysis of the materials which have been applied so far:

	Magnesit	[illegible]	Dolomit	Dolomit
MgO	88%		70%	35%
Fe_2O_3	6%			Spur
SiO_2	2%		Rest	2%
CaO	4%		20%	60%
Al_2O_3	-		-	2%

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6. "'These analyses of course give some indication only of the materials in use, but of much greater importance with regard to performance and lining life is the mineralogical history of such materials, calcining process, crushing, grading, mixing with proper binders, temperature when mixing, mixing time, ramming of lining or pressing of bricks, burning-in of new converter linings etc.

7. "'For the linings were used magnesit of Veitsch in Radenthein /Austria/, dolomit of Czakova /Poland/ and Dornap, Stolberg Rheinland /Germany/ as well as magnesitic dolomit from Veitsch /Austria/.

8. "'Pre-fabricated blocks are being supplied as in the case for electric arc furnaces according to drawings from brick manufacturers. The pressed tar bonded bricks are either bought from manufacturers or/and preferably manufactured by the users themselves on site in order to avoid long transit and storage times particularly in the case of dolomitic materials.

9. "'Donawitz obtains pre-fabricated tar bonded magnesitic dolomit bricks of the Veitsche Magnesitwerke, while Linz manufactures its own bricks on site.

10. "'Of utmost importance is the proper granulation of the crushed material. The following sieve analysis has been applied so far with greatest success:

25%	0 - 1 mm %
25%	1 - 3 mm %
25%	3 - 8 mm %
25%	8 - 16 mm %

11. "'This analysis is being prepared for both bricks and ramming material.

12. "'The tar for bonding /special steel works tar/ must be properly dehydrated and should have a certain content of pitch. For the manufacture of bricks from Magnesit or magnesitic dolomit 6% of tar or in the case of calcined dolomit 8 - 10% are necessary. For ramming mixtures about 1 - 2% more tar may be necessary.'"

13. Meier also commented on a 35-ton converter lining which is used at Linz and a 25-ton converter which is used at Donawitz:

14. "In the case of Linz, conventional type existing converter-shells have been adapted to the new process while Donawitz built new shells which are of the symmetric type. Both plants use bricks for this lining. [redacted] 25X1X 25X1X 25X1X 25X1X 25X1X

[redacted] The material at Ebbw Vale being exactly the same as in the case of Corby, the Dolomit from Steetly and the specially destilled and prepared steel works tar from the Yorkshire Tar Destillery. In both cases, whether bricked or rammed, the lining life was equally good. However, a bricked lining has its advantages over a fully monolytic lining:

"a) With bricks one is able to shape the converter inside as one wishes such as thickening up parts of the lining which is prone to excessive wear, etc, whilst with ramming one is compelled to ram up in accordance with the round and cylindric steel shell pattern.

"b) Once a converter lining is finished and has to be replaced by a new lining, it is much easier to break out an old bricked lining than an old monolytic lining.

"c) Less man-hours are needed for bricking up a converter in comparison with ramming. At Corby, [redacted] a complete new monolytic lining from the moment last heat out to the commencement of blowing steel in new lining, eight hours cooling down, 14 hours stripping or breaking out old lining, two hours scaffolding, 48 hours ramming /approximately 100 t of dolomit tar mixture for a 25 t converter/, eight hours firing and burning-in. 25X1X

At Ebbw Vale for bricking [redacted] 25X1X approximately eight hours for cooling down, 10 hours breaking out, two hours scaffolding, 36 hours bricking, eight hours firing and burning-in.

15. "By the way, at the beginning of the last war, Corby abandoned the monolytic linings also and ever since they brick their converters now with the so-called '341' brick /pressed dolomit brick dipped in tar/, which is manufactured by General Refractories Ltd in Sheffield. They claim as advantage in comparison with the earlier used monolytic lining to obtain more uniform lining lifes.

16. [redacted] 25X1X the calcined dolomit [redacted] 25X1X will be the perfect base material for making either bricks [redacted] 25X1X or ramming compositions for oxygen blown converters. [redacted] 25X1X 25X1X [redacted] The point is to make a grading which give after ramming or pressing the densest packing.

17. "As equipment [redacted] I would suggest the following items: 25X1X 25X1X

a) Air tight storage bins to prevent dehydration

b) Steam heated pug mills

c) Steam heated tar tank /20 t/

d) Steam heated tar boiler

e) Brick press

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